UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/706,926	11/06/2000	Rajashri Joshi	N0069US	8587

37583 7590 12/23/2008

NAVTEQ NORTH AMERICA, LLC
425 West RANDOLPH STREET
SUITE 1200, PATENT DEPT
CHICAGO, IL 60606

EXAMINER	
LE, MIRANDA	

ART UNIT	PAPER NUMBER
2169	

MAIL DATE	DELIVERY MODE
12/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/706,926	Applicant(s) JOSHI, RAJASHRI
	Examiner MIRANDA LE	Art Unit 2169

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 September 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,3,4 and 6-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,3,4 and 6-27 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/22/08 has been entered.

This communication is responsive to Amendment, filed 09/22/08.

Claims 1, 3-4, 6-27 are pending in this application. Claims 1, 8, 11, 13, 16, 20, 24 are independent claims. In this Amendment, claims 1, 8, 11, 13, 16, 20, 24 have been amended. This action is made non-Final.

Claim Objections

Claims 1, 8, 13, 16 are objected to because of the following informalities: “computer-usable medium” should be "computer-usable **storage** medium". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 8, 11, 13, 16, 20, 24 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding independent claims 1, 8, 11, 13, 16, 20, 24, it was not disclosed how "wavelet coefficients instead of the latitude and longtitude datapoints represent geographic features".

Claims 3, 4, 6-7, 9-10, 12, 14-15, 17-19, 21-23, 25-27 are dependent upon claims , 8, 11, 13, 16, 20, 24, and are likewise rejected.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 20-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

According to 35 USC § 101, a patentable process must (1) be tied to a particular apparatus or machine or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. *See In re Bilski,* 2007-1130 (Fed. Cir. 2008) *slip op at* 10-11 ("The Supreme Court, however, has enunciated a definitive test to determine whether a process claim is tailored narrowly enough to encompass only a particular application of a fundamental principle rather than

to pre-empt the principle itself. A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing").

Independent claim 20 is not tied to a particular apparatus or machine because computing a first/second plurality of wavelet coefficients and generating the database error metric based on a wavelet transform... do not necessarily involve the use of a computer or machine. One skilled in the art could interpret computing plurality of wavelet coefficients as data written out on paper. Therefore, claims 39, 72-76 are not tied to a particular apparatus or machine; and are thus directed to a non-statutory process.

Claims 21-23, are dependent upon claim 20, do not add any limitations which correct the deficiencies of claim 20, and are therefore also similarly rejected.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is

advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 7, 8, 9, 11, 13, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. (US Patent No. 6,108,609), in view of Knupp (US Patent No. 5,966,672), and further in view of Pavone et al. (US Patent No. 5,663,929).

As per claim 1, Qian teaches a method for representing cartographic data *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)* in a computer-based system, comprising:

providing a cartographic database *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)* containing latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations corresponding to a plurality of geographic features *(i.e. The system and method first selects a filter P(z) in response to user input, wherein a mother wavelet is associated with the filter P(z). Selecting the type of*

filter P(z) comprises selecting an orthogonal type or biorthogonal type of filter, as well as selecting either a maximum flat type of filter or equiripple type of filter, Summary);

computing a plurality of wavelet coefficients *(i.e. wavelet coefficients, col. 3, lines 19-43)* form said latitude and longitude data points *(i.e. Wavelet analysis can be used for a variety of functions, col. 20, lines 58-62)* corresponding to one of said geographic features in the cartographic database *(i.e. the user further can select a number of taps parameter in response to user input, wherein the number of taps parameter determines a number of coefficients of P(z), Summary)*, wherein said wavelet coefficients obtained with a wavelet *(i.e. This procedure is called the wavelet transform ψ (t) is called the mother wavelet because the different wavelets used to measure s(t) are the dilated and shifted versions of this wavelet. The results of each comparison, Wm,n, are named wavelet coefficients, col. 3, lines 19-43)*, wherein said wavelet being one of a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7)*, and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable, wherein said computing the wavelet coefficients includes applying a wavelet transform to a function defined by the data points representing the geographic feature *(i.e. a system and method for*

graphically designing a mother wavelet. The system and method thus enables the user to interactively design a mother wavelet for a desired test signal or application using graphical design techniques. The present invention allows a user to arbitrarily design new mother wavelets in real time using an improved graphical user interface, Summary);

indexing the wavelet coefficients *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)* by a plurality of display scales *(i.e. The index m and n are the scale, col. 3, lines 19-43; Refinement--Defines how many levels to go through to compute the wavelet and scaling function. A proper wavelet usually converges after 4 or 5 levels, col. 19, lines 62-64)*; and

after said step of computing, storing the wavelet coefficients in a computer-usable database on a physical storage medium *(i.e. The user can save all design results as text files for use in other applications, col. 20, lines 1-19; This section introduces a few applications that the user can develop with the help of this toolkit. The user can create all the examples described in this section with or without LabVIEW, because the user always can incorporate the filter bank coefficients into his applications from previously saved text files, col. 20, lines 1-19)*, the wavelet coefficients instead of said latitude and longitude data points being usable for displaying a representation of the geographic feature in the

computer-base system *(i.e. Save Scaling and Wavelets--Saves the scaling functions and wavelets for the analysis and synthesis filters in a text file, col. 19, lines 65-67).*

Qian implicitly taches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and*

geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obaining imaging volume data of a structure having a target of interest as taught by Knupp *(col. 4 , lines 43-50).*

Qian and Knupp do not specifically teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

As per claim 8, Qian teaches a method of displaying on a computer output device a representation of a geographic feature *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*, comprising:

retrieving *(i.e. the user further can select a number of taps parameter in response to user input, wherein the number of taps parameter determines a number of coefficients of P(z), Summary)* from a computer-usable database a plurality of wavelet coefficients *(i.e. The system and method first selects a filter P(z) in response to user input, wherein a mother wavelet is associated with the filter P(z). Selecting the type of filter P(z) comprises selecting an orthogonal type or biorthogonal type of filter, as well as selecting either a maximum flat type of filter or equiripple type of filter, Summary)* associated with the geographic feature *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)*, wherein a wavelet being one of a family of functions having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7)*, and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable, the wavelet coefficients being derived

from a plurality of latitude and longitude data points specifying geographic locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*; and

using the wavelet coefficients instead of latitude and longitude data points to display the representation of the geographic feature on the computer output device *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).*

Qian implicitly teaches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to*

implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57);

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4, lines 43-50).*

Qian and Knupp do not exactly teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

As per claim 11, Qian teaches a system for displaying on a computer output device a representation of a geographic feature, comprising:

a database *(i.e. the user further can select a number of taps parameter in response to user input, wherein the number of taps parameter determines a number of coefficients of P(z), Summary)* storing a plurality of wavelet coefficients *(i.e. The system and method first selects a filter P(z) in response to user input, wherein a mother wavelet is associated with the filter P(z). Selecting the type of filter P(z) comprises selecting an orthogonal type or biorthogonal type of filter, as well as selecting either a maximum flat type of filter or equiripple type of filter, Summary)* associated with the geographic feature *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)*, wherein a wavelet being one of a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7),* and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable, the wavelet coefficients being derived from a plurality of latitude and longitude data points specifying geographic locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*; and

a processor configured to use the wavelet coefficients instead of latitude and longitude data points to display the representation of the geographic feature *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).*

Qian implicitly teaches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*,

as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4, lines 43-50).*

Qian and Knupp do not specifically teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

As per claim 13, Qian teaches a method of generating a computer-usable database that represents cartographic data, comprising:

providing a predetermined database containing data *(i.e. The system and method first selects a filter P(z) in response to user input, wherein a mother wavelet is associated with the filter P(z). Selecting the type of filter P(z) comprises selecting an orthogonal type or biorthogonal type of filter, as well as selecting either a maximum flat type of filter or equiripple type of filter, Summary)* indicating a plurality of latitude and longitude data points specifying geographic locations *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)*;

computing a plurality of wavelet coefficients *(i.e. wavelet coefficients, col. 3, lines 19-43)* from the latitude and longitude data points by applying a wavelet transform to a function defined by the latitude and longitude data points *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*, wherein a wavelet being one of a family of functions having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7)*, and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable,

wherein said wavelet coefficients instead of said latitude and longitude data points are used to represent the cartographic data *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25*; and

storing the wavelet coefficients in the computer-usable database on a physical storage medium *(i.e. Save Scaling and Wavelets--Saves the scaling functions and wavelets for the analysis and synthesis filters in a text file, col. 19, lines 65-67).*

Qian implicitly teaches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and*

geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4, lines 43-50)*.

Qian and Knupp do not specifically teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

As per claim 16, Qian teaches a system of generating a computer-usable database that represents cartographic data, comprising:

a first computer-usable database *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)* storing data that represents a plurality of geographic features, said data that represents one of said geographic features comprises a plurality of latitude and longitude data points specifying geographic locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a processor configured to compute a plurality of wavelet coefficients from the latitude and longitude data points specifying geographic locations by applying a wavelet transform to a function defined by the latitude and longitude data points *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*, wherein said wavelet coefficients provide a representation of said geographic feature, wherein a wavelet being one of a family of functions having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7),* and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable,

a second computer-usable database on a physical storage medium, operatively coupled to the processor, for storing the wavelet coefficients, wherein said wavelet coefficients instead of said latitude and longitude data points are used to represent the cartographic data *(i.e. Save Scaling and Wavelets--Saves the scaling functions and wavelets for the analysis and synthesis filters in a text file, col. 19, lines 65-67).*

Qian implicitly teaches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4, lines 43-50).*

Qian and Knupp do not exactly teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to

modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

As per claim 7, Qian teaches the method of claim 1, wherein the wavelet coefficients are computed using a semi-discrete orthonormal wavelet transform *(i.e. The system and method first selects a filter P(z) in response to user input, wherein a mother wavelet is associated with the filter P(z). Selecting the type of filter P(z) comprises selecting an orthogonal type or biorthogonal type of filter, as well as selecting either a maximum flat type of filter or equiripple type of filter, Summary).*

As per claim 9, Qian teaches the method of claim 8, further comprising:

performing a zooming operation to display another representation of said geographic feature at a different scale *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).*

As per claim 18, Knupp teaches the system of claim 16, wherein the wavelet coefficients are computed by applying a wavelet transform to a function defined by the data points representing a geographic feature *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).*

Claims 4, 6, 10, 15, 19, 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. (US Patent No. 6,108,609), in view of Knupp (US Patent No. 5,966,672), in view of Pavone et al. (US Patent No. 5,663,929), and further in view of Petrou et al. (US Patent No. 6,243,483).

As per claim 20, Qian teaches a method for generating a database metric in a computer-based system, comprising:

computing a first plurality of wavelet coefficients from a plurality of first latitude and longitude data points included in a first cartographic database by applying a wavelet transform to a first function defined by the first latitude and longitude data points, wherein said wavelet coefficients instead of the first latitude and longitude data points represent geographic features *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*;

computing a second plurality of wavelet coefficients from a plurality of second latitude and longitude data points included in a second cartographic database by applying a wavelet transform to a second function defined by the second latitude and longitude data points *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*, wherein said wavelet coefficients instead of the first latitude and longitude data points represent geographic features, wherein a wavelet being one of a family of functions having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7)*, and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable,

generating the database metric based on a wavelet transform involving the first and second pluralities of wavelet coefficients, wherein said database metric provides a measurement comparing said first cartographic database and said second cartographic database *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of*

the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).

Although Qian implicitly teaches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and*

geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4, lines 43-50).*

Qian and Knupp do not exactly teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

Qian, Knupp, and Pavone do not explicitly teach a database error metric.

Petrou teaches this limitation *(i.e. To avoid the interference of outliers the tracker, in the preferred embodiment, uses the Ransac method for robust fitting as described below. If `P` denotes the set of points that we want to fit with a straight line, the algorithm is the following: Select two points from `P` randomly and determine the line `L` between them. For every point in `P` compute its distance to the line `L`, and then determine the subset `S` (consensus set) consisting of the points with distances less than a certain threshold `E` (error tolerance). If the number of points in the consensus set `S` is greater is greater than a given threshold, compute the line that fits set `S`, using the least square error method. Otherwise, repeat the above process until you find an appropriate consensus set `S` or fail after a desired number of times. If no "good" set was found, select the largest consensus set found and compute the line using it, col. 12, lines 46-61).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, Pavone, Petrou at the time the invention was made to modify the system of Qian, Knupp, Pavone to include the limitations as taught by Petrou. One of ordinary skill in the art would be motivated to make this combination in order to provide geographical integration of other information which could include engineering strip maps and ground property maps (such as soil and geology) in view of Petrou (col. 6, line 53 to col. 7, line 6), as doing so would give the added benefit of having the current pipeline map be compared with a previous pipeline map to determine whether the route of the pipeline or a

surrounding environment of the pipeline has changed as taught by Petroui (Summary).

As per claim 24, Qian teaches a system for generating a database metric, comprising:

a first cartographic database *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* for storing a first plurality of latitude and longitude data points *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a second cartographic database *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* for storing a second plurality of latitude and longitude data points *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*; and

a processor, operatively coupled to the first and second cartographic databases, configured to compute a first plurality of wavelet coefficients and a second plurality of wavelet coefficients, respectively *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale*

analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25), from the first and second pluralities of latitude and longitude data points by applying a wavelet transform to a first function defined by the first latitude and longitude data points and to a second function defined by the second latitude and longitude data points, wherein said wavelet coefficients instead of the latitude and longitude data points represent geographic features *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*, wherein a wavelet being one o f a family of functions having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/2) *(col. 2, formula 3-4)*

where in ψ_{ab} (x) is called a mother wavelet *(i.e. the mother wavelet function, See Abstract)*, a *(i.e. m, col. 2, line 55 to col. 3, line 7)* is called a dilation parameter, b *(i.e. n, col. 2, line 55 to col. 3, line 7)* is called a translation parameter *(i.e. n, col. 2, line 55 to col. 3, line 7),* and x *(i.e. t, col. 2, lines 55 to col. 3, line 7)* is an independent variable,

the processor generating a database metric based on the first and second pluralities of wavelet coefficients, wherein said database metric provides a measurement comparing said first cartographic database and said second

cartographic database *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).*

Qian implicitly taches these limitations:

cartographic data *(i.e. Data--Reads a 2D spreadsheet text file or stand image file, such as a.TIF or .BMP file. Be sure to choose the correct data type when reading the data file, col. 19, lines 48-50)*;

latitude and longitude *(i.e. Two-Dimensional Data Test, col. 19, lines 9-13)* data points indicating locations *(i.e. These variables simultaneously change as the user changes the design. If the user incorporates those parameters into his own application, the user can see the effect of the different design. FIG. 33 illustrates how LabVIEW uses these two parameters to implement a Wavelet Packet similar to the one displayed in FIG. 32, Wavelet Packet, col. 20, lines 52-57)*;

a family of function having a form:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a) *(col. 2, formula 3-4).*

Qian does not clearly state the above limitations.

Knupp teaches cartographic data *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41)*;

latitude and longitude data points indicating locations *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian and Knupp at the time the invention was made to modify the system of Qian to include the limitations as taught by Knupp. One of ordinary skill in the art would be motivated to make this combination in order to achieve maximum color resolution for the detection of geologic events represented by subtle amplitude changes within wavelets in view of Knupp *(col. 6, lines 53-62)*, as doing so would give the added benefit of obtaining image volume data of a structure having a target of interest as taught by Knupp *(col. 4 , lines 43-50).*

Qian and Knupp do not specifically teach a mother wavelet as:

ψ_{ab} (x) = ψ (|a| to the power $_{-1/2}$) ψ ((x-b)/a)

Pavone teaches this mother wavelet in col. 6, lines 50-55.

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, and Pavone at the time the invention was made to modify the system of Qian and Knupp to include the limitations as taught by Pavone. One of ordinary skill in the art would be motivated to make this combination in order to decompose each segment into a wavelet so as to obtain the wavelet coefficients in view of Pavone (Abstract), as doing so would give the added benefit of providing the stage of transmission of certain characteristic coefficients as taught by Pavone (Abstract).

Qian, Knupp, and Pavone do not explicitly teach a database error metric.

Petrou teaches this limitation *(i.e. To avoid the interference of outliers the tracker, in the preferred embodiment, uses the Ransac method for robust fitting as described below. If `P` denotes the set of points that we want to fit with a straight line, the algorithm is the following: Select two points from `P` randomly and determine the line `L` between them. For every point in `P` compute its distance to the line `L`, and then determine the subset `S` (consensus set) consisting of the points with distances less than a certain threshold `E` (error tolerance). If the number of points in the consensus set `S` is greater is greater than a given threshold, compute the line that fits set `S`, using the least square error method. Otherwise, repeat the above process until you find an appropriate consensus set `S` or fail after a desired number of times. If no "good" set was found, select the largest consensus set found and compute the line using it, col. 12, lines 46-61).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, Pavone, Petrou at the time the invention was made to modify the system of Qian, Knupp, Pavone to include the limitations as taught by Petrou. One of ordinary skill in the art would be motivated to make this combination in order to provide geographical integration of other information which could include engineering strip maps and ground property maps (such as soil and geology) in view of Petrou (col. 6, line 53 to col. 7, line 6), as doing so would give the added benefit of having the current pipeline map be compared with a previous pipeline map to determine whether the route of the pipeline or a

surrounding environment of the pipeline has changed as taught by Petroui (Summary).

As to claims 4, 10, 15, Qian, Knupp, and Pavone do not specifically teach the geographic feature is the boundary of a feature selected from the group consisting of a road, waterway, building, park, lake, railroad track, and airport.

Petrou teaches this limitation *(i.e. As previously mentioned, the pipeline mapping system can be adapted to provide geographical integration of other information which could include engineering strip maps and ground property maps (such as soil and geology). Integrating this information can provide detailed digital maps of the pipeline and its proximity and provide information concerning habitation (i.e., population density) and transport (i.e., roads and railroads). This ability to integrate additional data provides the pipeline operator access to other potentially valuable pipeline data, col. 6, line 53 to col. 7, line 6).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, Pavone, Petrou at the time the invention was made to modify the system of Qian, Knupp, Pavone to include the limitations as taught by Petrou. One of ordinary skill in the art would be motivated to make this combination in order to provide geographical integration of other information which could include engineering strip maps and ground property maps (such as soil and geology) in view of Petrou (col. 6, line 53 to col. 7, line 6), as doing so would give the added benefit of having the current pipeline map be compared with a previous pipeline map to determine whether the route of the pipeline or a

surrounding environment of the pipeline has changed as taught by Petroui (Summary).

As to claims 6, 19, Qian, Knupp, and Pavone do not specifically teach the step of computing the wavelet coefficients includes:

computing the wavelet coefficients by performing a least-squares fit.

Petrou teaches this limitation *(i.e. a least squares fitting line, col. 14, lines 4-16).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, Pavone, Petrou at the time the invention was made to modify the system of Qian, Knupp, Pavone to include the limitations as taught by Petrou. One of ordinary skill in the art would be motivated to make this combination in order to adjust the track pixels in view of Petrou (col. 14, lines 4-16), as doing so would give the added benefit of having the current pipeline map be compared with a previous pipeline map to determine whether the route of the pipeline or a surrounding environment of the pipeline has changed as taught by Petroui (Summary).

As to claims 21, 25, Qian teaches the metric is a total metric based on a plurality of wavelet scales *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal*

and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).

Petrou teaches the error metric *(i.e. To avoid the interference of outliers the tracker, in the preferred embodiment, uses the Ransac method for robust fitting as described below. If `P` denotes the set of points that we want to fit with a straight line, the algorithm is the following: Select two points from `P` randomly and determine the line `L` between them. For every point in `P` compute its distance to the line `L`, and then determine the subset `S` (consensus set) consisting of the points with distances less than a certain threshold `E` (error tolerance). If the number of points in the consensus set `S` is greater is greater than a given threshold, compute the line that fits set `S`, using the least square error method. Otherwise, repeat the above process until you find an appropriate consensus set `S` or fail after a desired number of times. If no "good" set was found, select the largest consensus set found and compute the line using it, col. 12, lines 46-61).*

As to claims 22, 26, Qian teaches:

selecting a wavelet scale *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25)*; and

restricting the computation to the selected wavelet scale to generate a layer metric *(i.e. Using wavelet analysis, one also can look at a signal from different scales, commonly called multiscale analysis. Wavelet transform-based multiscale analysis provides a better understanding of the signal and provides a useful tool for selectively discarding undesired components, such as noise and trend, that corrupt the original signals, col. 21, lines 20-25).*

Petrou teaches restricting the error computation, the error layer *(i.e. To avoid the interference of outliers the tracker, in the preferred embodiment, uses the Ransac method for robust fitting as described below. If `P` denotes the set of points that we want to fit with a straight line, the algorithm is the following: Select two points from `P` randomly and determine the line `L` between them. For every point in `P` compute its distance to the line `L`, and then determine the subset `S` (consensus set) consisting of the points with distances less than a certain threshold `E` (error tolerance). If the number of points in the consensus set `S` is greater is greater than a given threshold, compute the line that fits set `S`, using the least square error method. Otherwise, repeat the above process until you find an appropriate consensus set `S` or fail after a desired number of times. If no "good" set was found, select the largest consensus set found and compute the line using it, col. 12, lines 46-61).*

As to claims 23, 27, Knupp teaches the data points are selected from the group consisting of coordinate pairs and coordinate triples *(i.e. coordinate information for locating all data will be needed, which includes X, Y, Z and*

geometry data for seismic, well coordinates, cartographic data, and well deviation data, col. 18, lines 39-41).

Claims 3, 12, 14, 17are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al. (US Patent No. 6,108,609), in view of Knupp (US Patent No. 5,966,672), in view of Pavone et al. (US Patent No. 5,663,929), and further in view of Castelli et al. (US Patent No. 5,978,788).

As to claims 3, 12, 14, 17, Qian, Knupp, and Pavone do not explicitly teach the data points include altitude.

Castelli teaches this limitation *(i.e. In order to generate the FACT table, the attributes of the relational table are identified as Time, latitude(LAT), longitude(LON), and Altitude. The values for the attribute time is mapped to a value in an interval between 0.0 and 101.0, the latitude is mapped to a value in an interval between 0 and 180, and the longitude is mapped to a value in an interval between 0 and 90. Note that the mapping is one-to-one and reversible. However, additional empty entries might have to be created. For example, not all the time values between 0.0 and 101.0 necessarily have corresponding attribute values in the relational table. Similarly, not all the values in the valid ranges of latitude, longitude or altitude necessarily have valid entries in the original table. Thus, the FACT table can be much larger than the original table, col. 5, lines 5-28).*

It would have been obvious to one of ordinary skill of the art having the teaching of Qian, Knupp, Pavone, Castelli at the time the invention was made to

modify the system of Qian, Knupp, Pavone to include the limitations as taught by Castelli. One of ordinary skill in the art would be motivated to make this combination in order to generate multi-representations of a data cube in view of Castelli (Summary), as doing so would give the added benefit of storing the projections generated from the wavelet transformation for later synthesis as taught by Castelli (col. 6, lines 25-38, Summary).

Response to Arguments

With respect to claims 1, 3-4, 6-27, Applicants have amended the independent claims 1, 8, 11, 13, 16, 20, 24 to recite a new limitation “wavelet coefficients instead of the latitude and longitude datapoints represent geographic features”; however, upon further consideration, a new ground(s) of rejection is made in view of newly found prior arts.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James K. Trujillo, can be reached at (571) 272-3677. The fax number to this Art Unit is (571)-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Miranda Le/
Primary Examiner, Art Unit 2169